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APPLIED DEMOGRAPHY: ITS CURRENT SCOPE AND FUTURE DIRECTION IN THE UNITED STATES

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SUMMARY

Applied demography comprises a diverse set of applications that draw on demographers' specialized knowledge and technical skills. Those applications often stem from demographers' familiarity with census data and their facility in adapting it to business and public sector concerns. This paper offers an overview of the field's current scope, evolution, and prospective future course. Its major points are:

1. Applied demography is driven by problems; it is not a theory-directed body of knowledge. Its evolution therefore mirrors contemporary issues to which demographic perspectives and data apply.
2. Professionally, applied demographers are diversely situated but linked through a national network of personal contacts. Many work for state and regional governmental agencies; some are employed within the commercial data industry; a few operate as entrepreneurs. Most are occasional practitioners responding to various commercial, legislative, and judicial concerns demanding the use of demographic information.
3. Factors underlying its growth include newly available data for matching information on individual consumers and heightened competitive pressures within recently deregulated U.S. markets.

The underlying factors fostering the recent growth of applied demography also foreshadow its future development. The technology for storing, retrieving, and matching data has introduced potential applications that only a few years ago were entirely beyond the realm of possibility. Expanded automated registry of microdata on individuals is affording unprecedented detail for targeting consumers based on their own personal characteristics rather than those of the neighborhoods they inhabit.

APPLIED DEMOGRAPHY: ITS CURRENT SCOPE AND FUTURE DIRECTION IN THE UNITED STATES[1]

by

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I. INTRODUCTION

Not many years ago, applied demography was little more than a collection of activities on the periphery of academic research. Now these activities are coalescing into a recognizable field of endeavor as demographers apply their specialized knowledge and technical skills to a widening arena of problems. As of 1988, fully one-fourth of the Population Association of America's membership cite applied demography as one of their specialties (Stephen, 1988).

What does this field now encompass, how has it evolved, and where is it headed? What distinctive contributions are applied demographers making? I shall offer an overview of how demographic analysis is being applied in the public sector and especially the business world. My emphasis will be on (1) the scope of applications, (2) the structures that are emerging, and (3) future directions of growth over the next several years. Major points are:

1. Applied demography is driven by problems; it is not a theory-directed body of knowledge. Its evolution therefore mirrors contemporary issues to which demographic perspectives and data apply.

[1]Keynote address at the Conference on Local Area Demography in Business and Government, organized by the British Society for Population Studies and the Institute of British Geographers with support by CACI Market Analysis. The conference was held at the University of Nottingham, England, September 12-14, 1988.

2. Professionally, applied demographers are diversely situated but linked through a national network of personal contacts. Many work for state and regional governmental agencies; some are employed within the commercial data industry; a few operate as entrepreneurs. Most are occasional practitioners responding to various commercial, legislative, and judicial concerns demanding the use of demographic information.
3. Factors underlying its growth include newly available data for matching information on individual consumers and heightened competitive pressures within recently deregulated U.S. markets.

The widening range of problems that now command the attention of demographers (plus others applying their methods) testify to the field's expanding scope. To provide some indication of that scope, I shall briefly review some representative applications that are giving further definition to this field.

II. SCOPE OF APPLICATIONS

STATE/LOCAL APPLICATIONS

The concerns of state and local governments define one continuing area within this field. The long interval between decennial U.S. censuses generates a continuing need for "official" estimates of each local jurisdiction's current population, which figure in various formulas for transferring resources from higher levels of government to lower ones. Such estimates are one basis on which jurisdictions compete for various types of resources. Funding formulas for state contributions to maintain county health services, for example, are tied to population. Federal revenue sharing (until its recent demise) tied the transfer of federal tax dollars directly to each local jurisdiction's population. (One spinoff of revenue sharing was the Bureau of the Census's development of a new method for estimating population at this finer geographic scale.) The "fair share" of government-subsidized housing that localities are obliged to accept also may be tied to official estimates of local population.

Local governments and authorities need current population estimates and forecasts for many other purposes: to calculate vital rates and various indicators of service delivery, public health, accessibility to hospitals and other health facilities; to forecast future demands (e.g., school enrollments); and to certify compliance with particular legal mandates (e.g., for demographically representative trial juries).

Certain structures have evolved over the years to address these needs. Usually, a state agency prepares the "official" set of estimates and forecasts for localities, using methods approved by and coordinated through the Federal-State Cooperative Program of the U.S. Bureau of the Census. Typically, these estimates and projections extend down to the county level, and sometimes to individual cities. Below the county level, the task usually gravitates to regional planning authorities and county health departments. These agencies prepare postcensal estimates (and sometimes forecasts) for traffic analysis areas, health planning areas, census tracts, and other neighborhood-level geographic units. Whatever the agency, someone within it typically fills the "applied demographer" role. This may be someone trained at a recognized academic population center, but more often it is someone who has learned on the job.

Small-area forecasting is a partly commercial enterprise, conducted by for-profit and nonprofit organizations. Some organizations (e.g., the National Planning Association) concentrate on regional economic forecasting (using proprietary econometric models); the future populations such forecasts imply for multicounty regions are more a byproduct. Below the county level (and especially for census tracts), the commercial data industry is virtually alone in forecasting demographic variables. Various firms have in-house applied demographers who devise forecasting methodology, audit the input data that are used, and develop innovative ways to package small-area data to meet various client needs.

BUSINESS APPLICATIONS

The types of business concerns now commanding the attention of applied demographers are exceedingly varied. *Marketing and retailing* concerns (probably the dominant type) involve linking products and services to consumers who have particular wants and needs. These needs, of course, are diversifying as households and lifestyles diversify. *Corporate human resource* concerns define a somewhat newer area of activity, prompted by growing business interest in the changing structure and makeup of the work force, and the emergence of new "family-workplace" concerns. *Framing strategic business decisions* with reference to future demographic contexts constitutes a third developing area of application. In all three types of business applications, applied demographers make themselves useful in various ways that, more often than not, stretch beyond the boundaries of demographic analysis per se.

Business applications of demography lack the kinds of structures that have evolved with state and local applications. The Population Association of America has a Committee on Business Demography, which issues a periodic newsletter (*Applied Demography*) in conjunction with PAA's Committee on State and Local Demography. Books and monographs on the subject of business demography are beginning to appear (see Pol, 1987). A clearer structure may emerge if applied demography curricula are introduced in business school settings (which a few institutions have under consideration).

Marketing and Retailing

Demographic information and analysis have become essential to identifying, locating, and understanding the diverse consumer groups that form markets for goods and services (Merrick and Tordella, 1988). The commercial data industry furnishes information (and the technology for accessing it) but not necessarily the analytic depth some marketers may need. That need has created a niche for analysts who know how to *use* demographic data to link products and services to consumer needs.

Part of what fosters the involvement of demographers here is their technical familiarity with census data and definitions. They know where to access the data and what the numbers mean. Indeed, any data-oriented individual (whether trained in demography, marketing, or some other field) who possesses a solid command of census data can find a useful niche as an applied demographer. The analytically more sophisticated applied demographers not only track population shifts, they also provide marketers with insights into how those shifts may shape consumer choice. For example:

- Although fertility is low, delayed childbearing may strengthen the sale of maternity fashions, because so many mature mothers-to-be are employed and want to dress well on the job.
- Demographic shifts have diversified consumer markets. With the predominance of two-income couples, it is increasingly important to distinguish segments that are primarily "time-sensitive" from the traditionally "price-sensitive" segments.
- As demographic shifts orient most people toward convenience, consumers seek to purchase what they need quickly, at hours of their own choosing, and preferably all in one store. Growth in one-stop shopping, direct marketing, and home-delivered food reflects these developments.

Human Resource Planning

U.S. companies now recognize that the demographics of their work forces have important long-term implications for benefits, productivity, and business profitability. This recognition is spurring more general interest in how demographic changes are affecting the workplace.

Contraction and expansion in the number of workers at different age ranges has begun to affect labor markets. At the entry level, spot shortages are appearing as the size of entering cohorts shrinks. Simultaneously, companies that once curtailed new hiring now find they have disproportionate numbers of employees entering the middle and later stages of their careers. As too many employees compete for too few mid-

level positions, corporations are challenged to retain the best of these more experienced workers as career ladders grow congested.

The developing concern with family-workplace issues further illustrates the broadening applicability of the demographic perspective. With the influx of mothers into the work force and changes in family structure and composition, dependent-care needs are changing. These changes are demanding flexibility in daily work schedules and other forms of employer responsiveness (Kamerman and Kahn, 1987).

Until quite recently, business was largely oblivious to the rapidly changing demographic context and the ensuing conflicts between family and workplace obligations. By helping their employees balance work and family responsibilities, a company can advance its own interests, reduce absenteeism, strengthen recruitment, and retain valued employees. That recognition is fostering interest in "responsive workplace" policies and a need for more detail on a company's own work force: how many employees face what kinds of family obligations, and how they go about meeting them. These developments will further the application of demographic analysis, advice, and forecasts to human resource issues.

Strategic Business Issues

Whether to enter or avoid a particular market, where to site a shopping mall, or how to accommodate the aging of a corporation's work force are all strategic decisions that focus attention on the long term. Here, applied demographers can play several potential roles, some still at an early stage of emergence.

First, the applied demographer can act as a catalyst, opening up thought processes within an organization and sparking new insights and ideas. Demographers excel at calling attention to long-range shifts, and they introduce a useful frame of reference for comprehending them. Describing trends with reference to cohort changes--in women's labor force participation, in older workers' propensity to retire or to work part-time, in the comparative health and vigor of the aged--provokes thought and generates discussion between a corporation's own analysts and its senior managers.

In other instances, the applied demographer can give specific empirical meaning to various facets of an overall business strategy. For someone seeking to target certain types of markets, demographers can identify which census measures to use.

In yet another role, the applied demographer may provide an analytic framework for decisionmaking--that is, systematize the various factors that must be weighed to reach a decision.

III. APPLYING DEMOGRAPHIC ANALYSIS TO STORE SITE SELECTION

A case study will illustrate certain of the above points, notably those pertaining to strategic business decisions. It shows how applied demographic concepts can be fitted with geographic models to strengthen each discipline's perspective on a problem. Also, it illustrates how an analytic framework informed by both disciplines can help structure the decisionmaking process itself.

The project involved pinpointing the best prospective supermarket locations in a densely settled and ethnically diverse metropolitan region. The kind of supermarket to be sited--known as a combination store--is a very large type, only recently introduced in the United States.

Beyond its large size, the combination store has several other features that distinguish it from a typical supermarket: a wider range of merchandise, a more spacious milieu, and a layout that reinforces one-stop shopping (the concept behind this new type of store). Indeed, combination stores are targeted for the broad segment of consumers attracted by the convenience of one-stop shopping, especially two-income couples whose busy schedules necessitate convenience. Everyone has to buy groceries every few days; the logic behind the combination store is to sell shoppers a variety of other more profitable items while they are in the store.

Combination stores are expensive. A single one represents an investment of about $10 million, intended to be profitable for at least 15 years. Stakes this large require positioning such a store with great care and confidence that the surrounding trade area will continue to

generate hundreds of thousands of dollars weekly in sales--the necessary volume to sustain the store.

The objectives of this project were to screen every one of several thousand square miles within the metropolitan region and identify the ten highest-potential trade areas, then pinpoint the optimal site (specific street corner) within each area, rank the top choices, and justify that ranking. (We were to ignore the street corner's present use, because this optimal site was to serve as a hypothetical reference point for narrowing the search for an available parcel nearby each of the ten "hot spots.") The steps I shall describe below illustrate several roles that applied demographers can play in the formulation of strategic business decisions.

1. DEFINING THE PROBLEM EMPIRICALLY

In this case, it was necessary to translate management's broad objectives into several distinct tasks, and to operationalize each. The first task was to estimate the potential dollar sales that would gravitate to a combination store, positioned in a hypothetical location. This requires measuring the density of consumers within the surrounding trade area and estimating the volume of sales consumers would generate weekly. We also had to adopt--and justify--our assumptions about the future stability of that population of consumers. What assurance could we offer that the same type of consumer base would persist over the next 15 years?

We defined estimated sales volume and the probable stability of the consumer base as the *fundamentals*. That is, an area had to register strong on both factors before we considered it further.

The second task was to identify and measure other socioeconomic factors that might enhance sales potential. We posited that certain combinations of socioeconomic characteristics would generate "hot spots" that standard analyses might overlook, because their sales potential was subtly concealed in the demographic makeup of the resident population.

For the first task, we drew on the geographers' conceptualization, as embodied in retail trade modeling (see, for example, Davis and Rogers, 1984). To advance beyond standard site-selection methodology,

however, we sought to incorporate other considerations that might disclose unrecognized potential for supermarkets generally and a combination store in particular. For example, two areas with the same density and income per household might differ in important ways--one might have proportionately more two-income couples (conducive to one-stop shopping) or large families (conducive to family-centered meals at home). The research literature suggested several such "enhancing factors" that might further strengthen sales potential. We narrowed our list of such factors to those we could measure with census tract data. The enhancing factors we incorporated, and our rationale for using them, were:

- *Low fixed costs*. Two comparable families, each with identical annual household income, may face vastly different fixed annual costs. Depending on how long ago they purchased their homes, annual mortgage payments could differ markedly. In certain areas, homeownership is skewed toward more recent (or distant) years, thereby heightening (or lowering) a typical household's fixed monthly costs. We posit that where such fixed costs are uncommonly low, potential store sales will be higher than estimated on the basis of household income.
- *Large family households*. Family households--particularly large ones--are more likely to eat at home than are nonfamily households (Bureau of Labor Statistics, 1983). Accordingly, a customer base composed disproportionately of people joined into families, and of households containing four or more members, should enhance potential food sales.
- *Two-income households*. Recent studies document a rapidly emerging "time-sensitive" segment within the supermarket shopping public (Food Marketing Institute, 1985: Table 15). Working women shop less frequently, patronize fewer different stores, are less inclined to economize than their nonemployed counterparts, and tend to favor doing all their grocery shopping in one store (Food Marketing Institute, 1982; Food Industry Management Program, 1983). Because a combination

store's distinctive appeal is one-stop shopping, an abundance of time-conscious consumers in a given trade area should enhance potential sales.

Briefly, then, the trade areas we sought were those possessing sound fundamentals and displaying unusual combinations of demographic factors likely to enhance those fundamentals in subtle but important ways.

A basic assumption concerned the radius of the trade area from which a combination store was assumed to draw its customers. Some newly collected data called the conventional wisdom into question: In-store surveys indicated a more tightly clustered pattern than had been supposed. Such stores appeared to draw virtually all their shoppers from within only a few miles, and the distance-decay function could be estimated empirically from the survey rather than based on hunches (see Fig. 1).

We developed a model to estimate the potential sales dollars that would gravitate to a hypothetical combination store from the multi-square-mile trade area surrounding each square mile in which it might be sited. We based this estimate on (1) the number of households within the trade area, (2) their distribution by household size, and (3) their distribution by income. We used a distance-decay function to weight these characteristics more heavily the closer they were to the particular square mile being evaluated. Weekly food-dollar sales were estimated on the basis of data relating food purchases to income and household size (Smallwood and Blaylock, 1981).[2] Representative curves displaying these relationships are shown in Fig. 2.

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[2]This equation, estimated from the Nationwide Food Consumption Survey, incorporates additive effects (more household members and/or higher household income) as well as diminishing marginal growth in consumption as either members or incomes increase. A six-member household, for example, consumes somewhat less food than do two three-member households with the same per capita income. Likewise, doubling per capita household income does not double food consumption at home.

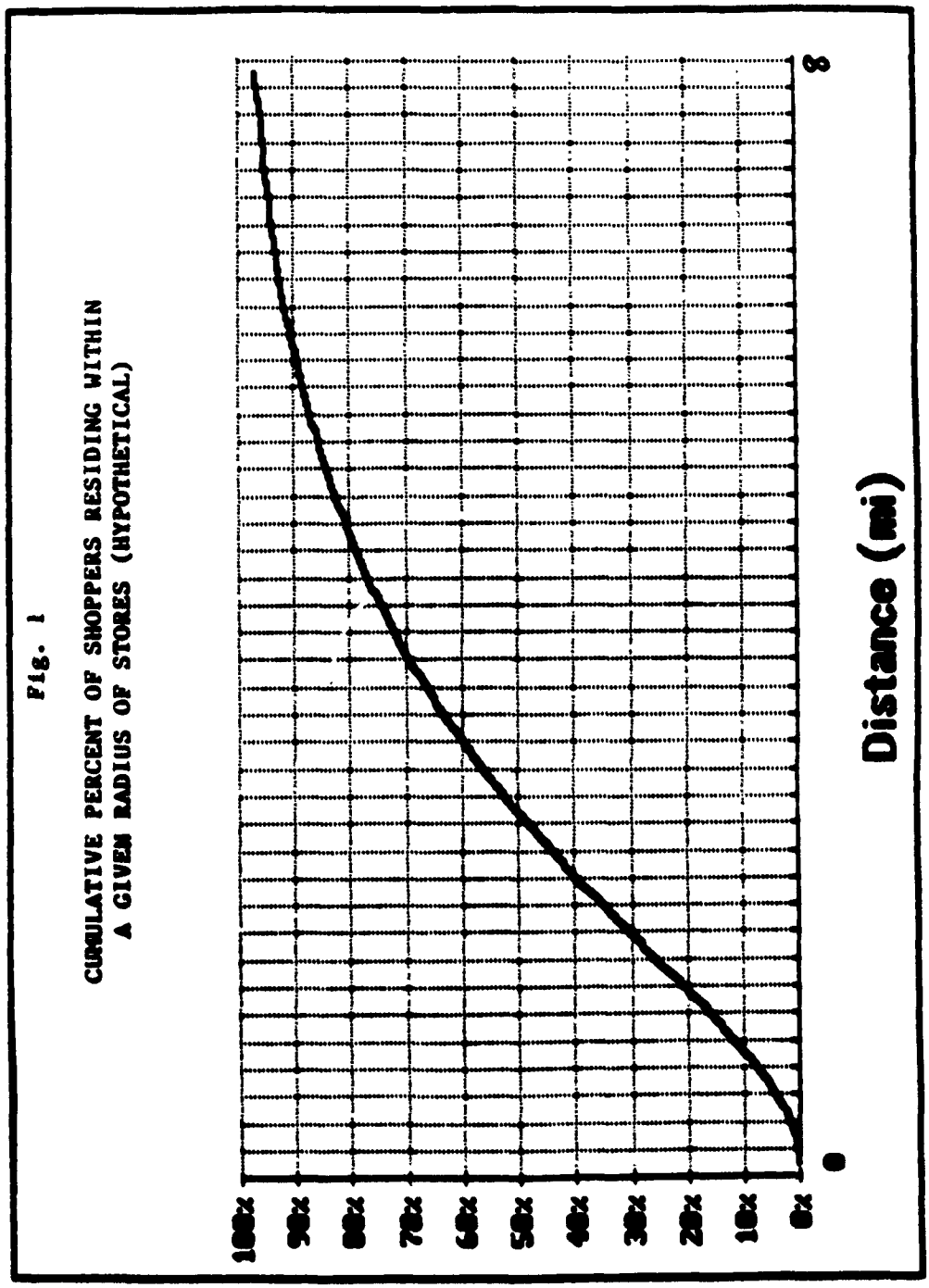
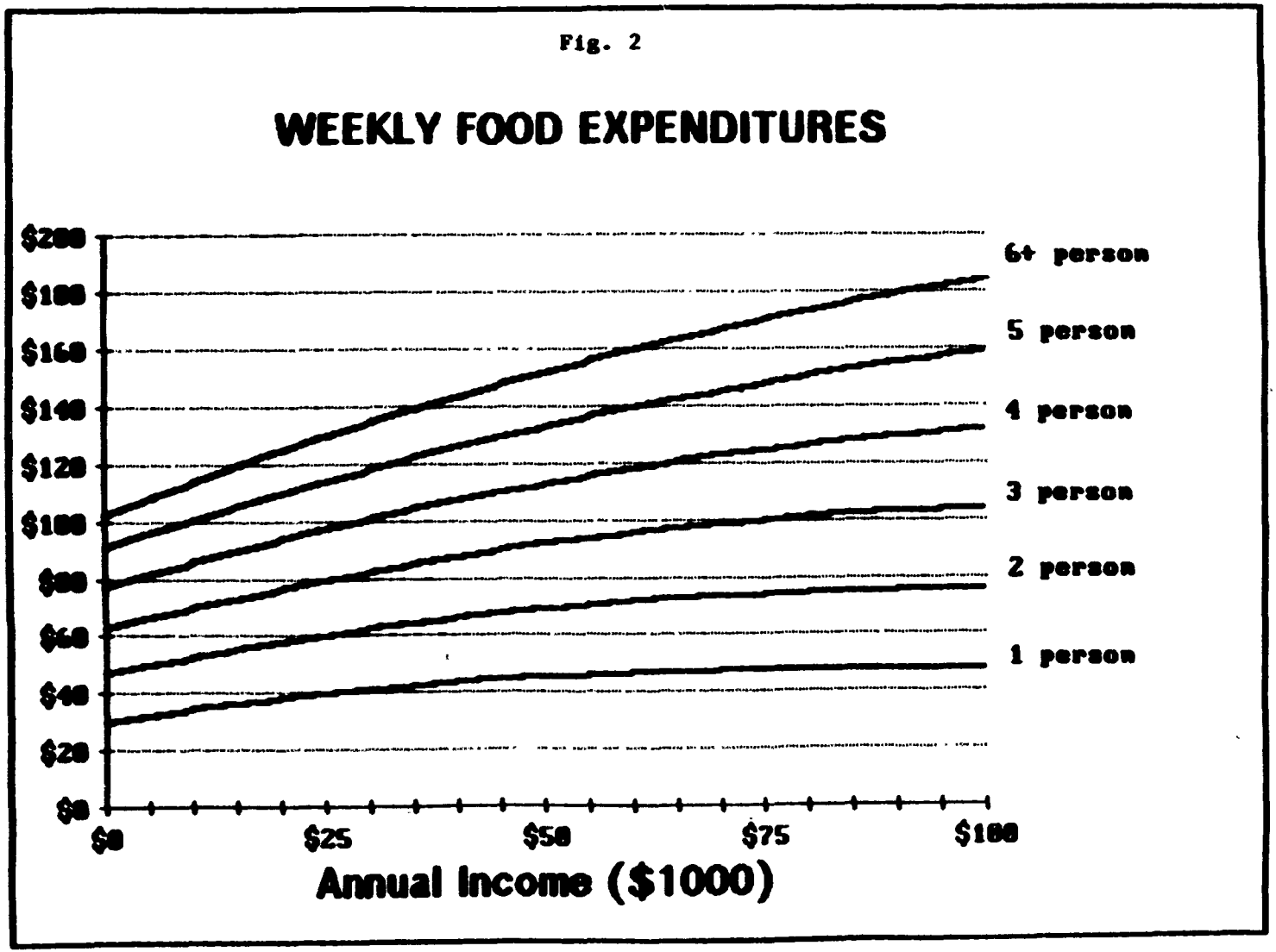


Fig. 1

CUMULATIVE PERCENT OF SHOPPERS RESIDING WITHIN A GIVEN RADIUS OF STORES (HYPOTHETICAL)

Fig. 2



Source: Calculated from Smallwood and Blaylock (1981)

2. FRAMING THE STRATEGIC DECISION

In this particular case, *how* the results were arrived at proved to be as important as the results themselves, illustrating how applied demographers sometimes provide an essential analytic framework. The person who made the final decisions had certain preconceptions and firmly held beliefs, grounded on his own previous experience. Familiarity with virtually every commercial street corner in the region directed his attention to concrete *places*. Our method added an analytic framework for thinking comparatively about the trade areas surrounding those places. Simply explaining the logic behind our procedures and the way each variable could be measured helped to structure his thinking systematically and shifted the debate toward factual, rather than impressionistic, criteria.

A key element here was the "Summary Scorecard" format (shown in Fig. 3). It illustrates the rationale for our top choices. First, the very best sites have high levels on the Sales Potential Index (SPI). This index was constructed to measure our estimate of the weekly sales volume that a typical combination store would generate within that square mile area, relative to several "benchmark stores" actually in operation. Thus, an SPI of 180 implies a volume of sales would be 80 percent above the average volume for this chain's typical combination store. Put another way, were an existing combination store now in operation to be picked up and dropped onto this particular site, the SPI implies that its sales volume would nearly double in so densely populated and prosperous a trade area.

SPIs this high are uncommon, but they are not rare. The extraordinary site is one that combines a high SPI and other attractive demographic fundamentals with a strong profile of enhancements. This is what makes the top-ranked site stand out. Fully 73 percent of its households are homeowners, and 62 percent are long-term established residents. Together, such levels foreshadowed long-term neighborhood stability in this top-ranked site. Moreover, its profile on the various enhancing factors surpassed that of most other finalists on most dimensions. This best site emerged on top, then, because it registers

Fig. 3

Summary Scorecard

Best Sites (Ranked)	FUNDAMENTALS			ENHANCING FACTORS			
	SPI	Home-owners	Estab. Residents	% Low Fixed Costs	% Family Members	% Large House-holds	% Dual Earners
Top	180	73	62	[redacted]	93	40	60
2nd	174	54	53	30	91	44	61
(tie)	159	56	48	28	89	39	63
3rd	131	62	54	32	93	39	[redacted]
4th	161	56	63	27	87	[redacted]	59
(tie)	152	58	63	27	87	[redacted]	60
5th	[redacted]	81	[redacted]	[redacted]	92	38	60
6th	[redacted]	64	67	27	87	[redacted]	61
7th	191	[redacted]	64	30	83	[redacted]	62
8th	199	[redacted]	64	36	85	[redacted]	60
9th	126	[redacted]	67	41	90	37	46
10th	136	54	63	31	86	[redacted]	60

Stands out Strong Moderate

high sales potential and an extraordinary combination of other strengths.

IV. FUTURE DIRECTIONS

Applied demography, I have suggested, comprises a diverse set of applications that draw on specialized knowledge and technical skills. Those applications often stem from demographers' familiarity with census data and their facility in adapting it to business and public sector concerns. It is these concerns that have driven--and will continue to drive--the further growth of applied demography as an expanding body of practice.

At least three factors that have fostered recent growth of applied demography also foreshadow the direction of its further development. First, technology for storing, retrieving, and matching data has introduced potential applications that only a few years ago were entirely beyond the realm of possibility. Examples are CD-ROM, high-capacity tape storage media for desktop use, and the increasing power of personal computers as workstations.

Second is growth in the automated registry of microdata on individual consumers and their purchase histories, shopping habits, and so forth. Examples are airline frequent-flier programs that track individual travel behavior; bar code scanners that track supermarket purchases; and the purchase histories that credit card companies record. In conjunction with newly appearing technologies, such microdata afford marketers unprecedented detail for targeting consumers based on their individual characteristics. The approaches used in direct marketing illustrate these possibilities: Customized national mailing lists are developed from personal characteristics and purchase histories collated from separate files.

Third is heightened competitive pressure within recently deregulated U.S. markets. Within entire industries (e.g., telecommunications, banking, and health care), firms now find they must cultivate the markets they once held virtually captive. Because of deregulation, these firms have to know their markets.

Clearly, the storage and processing of demographic data will expand further over the next several years. When the 1990 decennial census is released, the technology for accessing this information will have advanced far beyond what is now in use, and automated data registry will broaden possibilities for developing individual purchase profiles. The marketers' dictum of the 1980s ("You are where you live") may soon be replaced by "You are what you just bought."

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